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# Journal of the Society of Arts.

FRIDAY, SEPTEMBER 21, 1855.

## FREE PUBLIC LIBRARIES AND MUSEUMS.

The following Act of Parliament, relating to the establishment of Public Libraries and Museums, was passed last Session of Parliament, and the attention of the Institutions and others is called to its provisions.

### CAP. LXX.

An Act for further promoting the Establishment of Free Public Libraries and Museums in Municipal Towns, and for extending it to Towns governed under Local Improvement Acts, and to Parishes. [30th July, 1855.]

Whereas it is expedient to amend and extend the Public Libraries Act, 1850: Be it therefore enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords Spiritual and Temporal, and Commons, in this present Parliament assembled, and by the authority of the same, as follows:—

1. The Public Libraries Act, 1850, is hereby repealed; but such repeal shall not invalidate or affect anything already done in pursuance of the same Act, and all libraries and museums established under that Act or the Act thereby repealed shall be considered as having been established under this Act, and the Council of any Borough which may have adopted the said Act of one thousand eight hundred and fifty, or established a museum under the Act thereby repealed, shall have and may use and exercise all the benefits, privileges, and powers given by this Act; and all monies which have been borrowed by virtue of the said repealed Acts or either of them, and still remaining unpaid, and the interest thereof, shall be charged on the Borough rates, or a rate to be assessed and recovered in the like manner as a Borough rate to be made by virtue of this Act.

II. In citing this Act for any purposes whatever it shall be sufficient to use the expression, "The Public Libraries Act, 1855."

III. In the construction of this Act the following words and expressions shall, unless there be something in the subject or context repugnant to such construction, have the following meanings assigned to them respectively; that is to say, "parish" shall mean every place maintaining its own poor; "vestry" shall mean the inhabitants of the parish lawfully assembled in vestry, or for any of the purposes for which vestries are holden, except in those parishes in which there is a select vestry elected under the Act of the fifty-ninth year of King George the Third, chapter twelve, or under the Act of the first and second years of King William the Fourth, chapter sixty, or under the provisions of any Local Act of Parliament for the government of any parish by vestries, in which parishes it shall mean such select vestry, and shall also mean any body of persons, by whatever name distinguished, acting by virtue of any Act of Parliament, prescription, custom, or otherwise, as or instead of a vestry or select vestry; "ratepayers" shall mean all persons for the time being assessed to rates for the relief of the poor of the parish; "overseers of the poor" shall mean also any persons authorised and required to make and collect the rate for the relief of the poor of the parish, and acting instead of overseers of the poor; "Board" shall mean the Commissioners, trustees, or other body of persons, by whatever name distinguished, for the time being in office and acting in the execution of any improvement act, being an Act for draining, cleansing, paving, lighting, watching, or otherwise improving a place, or for any of those purposes; "improvement rates" shall mean the rates, tolls, rents, income, and other monies whatsoever which, under the provisions of any such improvement act, shall be applicable for the general purposes of such Act.

IV. The mayor of any municipal borough the population of which, according to the then last census thereof, shall exceed five thousand persons, shall, on the request of the town council, convene a public meeting of the burgesses of the borough, in order to determine whether this Act shall be adopted for the municipal borough, and ten days' notice at least of the time, place, and object of the meeting shall be given by affixing the same on or near the door of every church and chapel within the borough, and also by advertising the same in one or more of the newspapers published or circulated within the borough, seven days at least before the day appointed for the meeting; and if at such meeting two-thirds of such persons as aforesaid then present shall determine that this Act ought to be adopted for the borough, the same shall thenceforth take effect and come into operation in such borough, and shall be carried into execution in accordance with the laws for the time being in force relating to the municipal corporation of such borough: provided always, that the mayor, or, in his absence, the chairman of the meeting, shall cause a minute to be made of the resolutions of the meeting, and shall sign the same; and the resolutions so signed shall be conclusive evidence that the meeting was duly convened, and the vote thereat duly taken, and that the minute contains a true account of the proceedings thereat.

V. The expenses incurred in calling and holding the meeting, whether this Act shall be adopted or not, and the expenses of carrying this Act into execution in such borough, may be paid out of the borough fund, and the Council may levy by a separate rate, to be called a Library Rate, to be made and recoverable in the manner hereinafter provided, all monies from time to time necessary for defraying such expenses; and distinct accounts shall be kept of the receipts, payments, and liabilities of the Council with reference to the execution of this Act.

VI. The board of any district, being a place within the limits of any Improvement Act, and having such a population as aforesaid, shall, upon the requisition in writing of at least ten persons assessed to and paying the improvement rate, appoint a time not less than ten days nor more than twenty days from the time of receiving such requisition for a public meeting of the persons assessed to and paying such rate, in order to determine whether this Act shall be adopted for such district, and ten days' notice at least of the time, place, and object of such meeting shall be given by affixing the same on or near the door of every church and chapel within the district, and also by advertising the same in one or more of the newspapers published or circulated within the district seven days at least before the day appointed for the meeting; and if at such meeting two-thirds of such persons as aforesaid then present shall determine that this Act ought to be adopted for the district, the same shall thenceforth take effect, and come into operation in such district, and shall be carried into effect according to the laws for the time being in force relating to such Board.

VII. The expenses incurred in calling and holding the meeting, whether this Act shall be adopted or not, and the expenses of carrying this Act into execution in any such district, shall be paid out of the improvement rate, and the Board may levy as part of the improvement rate, or by a separate rate to be assessed and recovered in like manner as an improvement rate, such sums of money as shall be from time to time necessary for defraying such expenses; and the Board shall keep distinct accounts of their receipts, payments, credits, and liabilities with reference to the execution of this act, which accounts shall be audited in the same way as accounts are directed to be audited under the Improvement Act.

VIII. Upon the requisition in writing of at least ten ratepayers of any parish having such a population as aforesaid, the overseers of the poor shall appoint a time, not less than ten days nor more than twenty days from the time of receiving such requisition, for a public meeting of the ratepayers in order to determine whether this

Act shall be adopted for the parish; and ten days' notice at least of the time, place, and object of the meeting shall be given by affixing the same on or near the door of every church and chapel within the parish, and also by advertising the same in one or more of the newspapers published or circulated within the parish, seven days at least before the day appointed for the meeting; and if at such meeting two-thirds of the ratepayers then present shall determine that this Act ought to be adopted for such parish, the same shall come into operation in such parish, and the vestry shall forthwith appoint not less than three nor more than nine ratepayers, Commissioners for carrying the Act into execution, who shall be a body corporate by the name of "the Commissioners for Public Libraries and Museums for the Parish of \_\_\_\_\_ in the County of \_\_\_\_\_," and by that name may sue and be sued, and hold and dispose of lands, and use a common seal: Provided always, that in any parish where there shall not be a greater population than eight thousand inhabitants by the then last census, it shall be lawful for any ten ratepayers to deliver a requisition by them signed, and describing their place of residence, to the overseers or one of the overseers of the said parish, requiring the votes of the ratepayers at such meeting to be taken according to the provisions of the Act passed in the fifty-eighth year of the reign of King George the Third, chapter sixty-nine, and the votes at such meeting shall thereupon be taken according to the provisions of the said last-mentioned Act of Parliament, and not otherwise.

IX. At the termination of every year (the year being reckoned from and exclusive of the day of the first appointment of Commissioners) a meeting of the vestry shall be held, at which meeting one-third or as nearly as may be one-third of the Commissioners, to be determined by ballot, shall go out of office, and the vestry shall appoint other Commissioners in their place, but the outgoing Commissioners may be re-elected; and the vestry shall fill up every vacancy among the Commissioners, whether occurring by death, resignation, or otherwise, as soon as possible after the same occurs.

X. The Commissioners shall meet at least once in every calendar month, and at such other times as they think fit, at the public library or museum, or some other convenient place; and any one Commissioner may summon a special meeting of the Commissioners by giving three clear days' notice in writing to each Commissioner, specifying therein the purpose for which the meeting is called; and no business shall be transacted at any meeting of the Commissioners unless at least two Commissioners shall be present.

XI. All orders and proceedings of the Commissioners shall be entered in books to be kept by them for that purpose, and shall be signed by the Commissioners, or any two of them; and all such orders and proceedings so entered, and purporting to be so signed, shall be deemed to be original orders and proceedings, and such books may be produced and read as evidence of all such orders and proceedings upon any judicial proceeding whatsoever.

XII. The Commissioners shall keep distinct and regular accounts of their receipts, payments, credits, and liabilities with reference to the execution of this Act, which accounts shall be audited yearly by the poor-law auditor, if the accounts of poor-rate expenditure of the parish be audited by a poor-law auditor, but if not so audited, then by two auditors not being Commissioners, who shall be yearly appointed by the vestry, and the auditor or auditors shall report thereon, and such report shall be laid before the vestry by the Commissioners.

XIII. The expenses of calling and holding the meeting of the ratepayers, whether this Act shall be adopted or not, and the expenses of carrying this Act into execution in any parish, to such amount as shall be from time to time sanctioned by the vestry, shall be paid out of a rate to be made and recovered in like manner as a

poor-rate, except that every person occupying lands used as arable, meadow, or pasture ground only, or as woodlands or market-gardens, or nursery-grounds, shall be rated in respect of the same in the proportion of one-third part only of the full net annual value thereof respectively; the vestry to be called for the purpose of sanctioning the amount shall be convened in the manner usual in the parish; the amount for the time being proposed to be raised for such expenses shall be expressed in the notice convening the vestry, and shall be paid, according to the order of the vestry, to such person as shall be appointed by the Commissioners to receive the same: provided always, that in the notices requiring the payment of the rate there shall be stated the proportion which the amount to be thereby raised for the purposes of this Act shall bear to the total amount of the rate.

XIV. The vestries of any two or more neighbouring parishes having according to the then last census an aggregate population exceeding five thousand persons may adopt this Act, in like manner as if the population of each of those parishes according to the then last census exceeded five thousand, and may concur in carrying the same into execution in such parishes for such time as they shall mutually agree; and such vestries may decide that a public library or museum, or both, shall be erected in any one of such parishes, and that the expenses of carrying this Act into execution with reference to the same shall be borne by such parishes in such proportions as such vestries shall mutually approve; the proportion for each of such parishes of such expenses shall be paid out of the monies to be raised for the relief of the poor of the same respective parishes accordingly; but no more than three Commissioners shall be appointed for each parish; and the Commissioners so appointed for each of such parishes shall, in the management of the said public library and museum, form one body of Commissioners, and shall act accordingly in the execution of this Act; and the accounts of the Commissioners shall be examined and reported on by the auditor or auditors of each of such parishes; and the surplus money at the disposal as aforesaid of such Commissioners shall be paid to the overseers of such parishes respectively, in the proportion in which such parishes shall be liable to such expenses.

XV. The amount of the rate to be levied in any borough, district, or parish, in any one year for the purposes of this Act shall not exceed the sum of one penny in the pound; and for the purposes of the library rate all the clauses of the Towns Improvement Clauses Act, 1847, with respect to the manner of making rates, to the appeal to be made against any rate, and to the recovery of rates, shall be incorporated with this Act; and whenever the words "Special Act" occur in the Act so incorporated they shall mean "The Public Libraries Act, 1855;" the accounts of the said Board and Commissioners respectively with reference to the execution of this Act shall at all reasonable times be open, without charge, to the inspection of every person rated to the improvement rate, or to the rates for the relief of the poor of the parish, as the case may be, who may make copies of, or extracts from, such accounts, without paying for the same; and in case the Board or the Commissioners, or any of them respectively, or any of their respective officers or servants having the custody of such accounts, shall not permit the same accounts to be inspected, or copies of, or extracts from, the same to be made, every person so offending shall for every such offence forfeit any sum not exceeding five pounds.

XVI. For carrying this Act into execution the Council, Board, or Commissioners respectively may, with the approval of her Majesty's Treasury (and as to the Commissioners, with the sanction also of the vestry and the poor-law Board), from time to time borrow at interest, on the security of a mortgage or bond of the borough fund, or of the rates levied in pursuance of this Act, such sums of money as may be by them respectively required; and the Commissioners for carrying into exe-

oution the Act of the ninth and tenth years of her Majesty, chapter eighty, may from time to time advance and lend any such sums of money.

XVII. The clauses and provisions of "The Companies Clauses Consolidation Act, 1845," with respect to the borrowing of money on mortgage or bond, and the accountability of officers, and the recovery of damages and penalties, so far as such provisions may respectively be applicable to the purposes of this Act, shall be respectively incorporated with this Act.

XVIII. The Council of any borough and the Board of any district respectively may from time to time, with the approval of her Majesty's Treasury, appropriate for the purposes of this Act any lands vested, as the case may be, in a borough, in the Mayor, Aldermen, and Burgesses, and in a district in the Board; and the Council, Board, and Commissioners respectively may also, with such approval, purchase or rent any lands or any suitable buildings; and the Council and Board and Commissioners respectively may, upon any lands so appropriated, purchased, or rented respectively, erect any buildings suitable for public libraries or museums, or both, or for schools for science or art, and may apply, take down, alter, and extend any buildings for such purposes, and rebuild, repair, and improve the same respectively, and fit up, furnish, and supply the same respectively with all requisite furniture, fittings, and conveniences.

XIX. "The Lands Clauses Consolidation Act, 1845," shall be incorporated with this Act; but the Council, Board, and Commissioners respectively shall not purchase or take any lands otherwise than by agreement.

XX. The Council, Board, and Commissioners aforesaid respectively may, with the like approval as is required for the purchase of lands, sell any lands vested in the Mayor, Aldermen, and Burgesses, or Board, or Commissioners respectively, for the purposes of this Act, or exchange the same for any lands better adapted for the purposes; and the monies to arise from such sale, or to be received for equality of exchange, or a sufficient part thereof, shall be applied in or towards the purchase of other lands better adapted for such purposes.

XXI. The general management, regulation, and control of such libraries and museums, schools for science and art, shall be, as to any borough, vested in and exercised by the Council, and as to any district in and by the Board, and as to any parish or parishes in and by the Commissioners, or such Committee as such Council or Board may from time to time appoint, the members whereof need not be members of the Council or Board or be Commissioners, who may from time to time purchase and provide the necessary fuel, lighting, and other similar matters, books, newspapers, maps, and specimens of art and science, for the use of the library or museum, or school, and cause the same to be bound or repaired when necessary, and appoint salaried officers and servants, and dismiss the same, and make rules and regulations for the safety and use of the libraries and museums, and schools, and for the admission of the public.

XXII. The lands and buildings so to be appropriated, purchased, or rented as aforesaid, and all other real and personal property whatever presented to or purchased for any library or museum established under this Act, or school, shall be vested, in the case of a borough, in the Mayor, Alderman, and Burgesses, in the case of a district in the Board, and in the case of a parish or parishes in the Commissioners.

XXIII. If any meeting called as aforesaid to determine as to the adoption of this Act for any borough, district, or parish shall determine against the adoption, no meeting for a similar purpose shall be held for the space of one year at least from the time of holding the previous meeting.

XXIV. The Lord Mayor of the City of London shall, on the request of the Lord Mayor, Aldermen, and Commons of the City of London, in Common Council assembled,

convene a public meeting in manner herein-before mentioned of all persons rated and assessed to the consolidated rate in the City of London, in order to determine whether this Act, shall be adopted in the said City; and if at such meeting two-thirds of such persons then present shall determine that this Act ought to be adopted for the City of London, the same shall thenceforth take effect and come into operation in the City of London, and shall be carried into execution in accordance with the laws for the time being in force relating to the City of London: provided always, that the resolution of such public meeting, signed by the Lord Mayor, shall be reported to the said Lord Mayor, Aldermen, and Commons, in Common Council assembled, and entered on the minutes thereof, and such entry shall be evidence; the expenses incurred in calling and holding the meeting, whether this Act shall be adopted or not, and the expenses of carrying this Act into execution in the City of London, shall be paid out of the consolidated rate, and the Commissioners of Sewers of the City of London may levy a part of the consolidated rate, or by a separate rate, to be assessed and recovered in like manner as the consolidated rate, all monies from time to time necessary for defraying such expenses, and distinct accounts shall be kept of the receipts, payments, and liabilities of the said Lord Mayor, Aldermen, and Commons with reference to the execution of the Act.

XXV. The admission to all libraries and museums established under this Act shall be open to the public free of all charge.

XXVI. This Act shall not extend to Ireland or Scotland.

#### MALLEABLE IRON ORDNANCE.

A wrought-iron gun has been manufactured by Mr. Dundas, at Paragon Works, North Britain, on a principle maintained by him to be the only practicable method by which guns and mortars of that material and of large calibre could be made sound and trustworthy; the difficulty of procuring dense and solid forgings of great bulk being well known to every practical engineer. This gun, a 9-pounder, was sent down to Woolwich to be proved. Two heavy charges, of 9lb. of powder and a ball, the usual proof charge of a cannon of this size, were first fired from it. These produced no change in the gun, nor displacement of its parts. Fifty rounds of ordinary service ammunition were then rapidly fired from the cannon, causing no change whatever. The gun was then sent down to Shoeburyness for a further trial, and as 36 ordinary service rounds more were fired from it without any remarkable result, the charge was gradually increased to four, five, and lastly to six pounds of powder and two balls. Under this application the gun at length began to yield, and it finally became unserviceable at the third round of the last series,—six pounds of powder, two balls, and a wad. In all 152 rounds were fired from it. The following is a brief description of the method of the construction of this gun. Four bars of iron, about an inch thick, five inches broad, and the proper length of the gun, are put up longitudinally into segments of a circle, which if placed edge to edge, form the rough outline of the bore. The edges of these bars are then accurately planed. The bars or staves are then hooped temporarily as a cylinder by means of two rings at the extremities, and turned in a lathe to a surface perfectly true and cylindrical. A series of iron rings, three inches broad and three-quarters of an inch thick, carefully welded, are bored to a size slightly smaller than the barrel or cylinder; these, being afterwards expanded by heat, are one by one placed on the cylinder, and plunged into cold water. Instant contraction ensuing, the staves are compressed more powerfully than could be done by any artificial means, and no appearance of a joint in the staves is perceptible. The exterior surface of the mass is again turned perfectly cylindrical, and a second series of rings placed

in like manner over the first "breaking band." In the lathe the iron now assumes the exterior of a cannon, the trunnions having been previously placed on forged on a centre ring. To bore the gun with great perfection is very simple, as the boring bar can be supported at both ends, and the breech end of the gun being, for a few inches, bored slightly conically with a shoulder, into which fits a solid plug introduced from the muzzle, the cannon is now complete. Since this gun was made many improvements have suggested themselves to the inventor, who was much in doubt as to the proper proportions required by the separate parts of the cannon, and who, perhaps too confidently, made his gun much slighter than service ordnance of the same calibre, this being one-third lighter than a cast iron 9-pounder gun. By the substitution of tilted cast steel for iron staves further strength is expected, while, by corrugating the cylinder to the extent of from one-eighth to one-sixteenth of an inch, and turning the rings to fit these corrugations when shrunk on, great additional tenacity will be gained.

## Colonial Correspondence.

### BRITISH HONDURAS.

Belize, British Honduras,  
August 16th, 1855.

SIR,—In my last letter I gave you a description of the mode of cutting mahogany in Honduras, which I thought might be interesting to some of the readers of your journal. There is, perhaps, nothing very curious, or worthy of especial consideration in the felling of a tree. Two men, black as ebony, naked to the waist, and armed with huge axes, having handles five feet in length, station themselves one on each side of a tall mahogany tree; stroke after stroke descends with terrific force and steady aim; the bark flies—deeper and deeper become the clefts—another blow, and the Titan of the forest is seen to sway gently like a drunken man,—one more and it takes an inclination—then, with a slow and stately motion at first, it descends,—then more and more quickly, until at last it falls to the earth with a tremendous crash, which resounds like thunder, and evokes a shrill response from thousands of frightened birds, and low and sullen growls from the puma and the tiger, whose lairs are not far distant. There is nothing, perhaps, very particular in this, but the circumstances which accompany the operation, the individuals who perform it, the situation, and the fact that the very table at which we are sitting, quietly sipping our bohea, or quaffing our Lafitte, was one of those same trees growing in the midst of a tropical wilderness, amongst beasts of prey and birds of extraordinary plumage and strange notes, do, I think, invest it with a certain interest, which the cutting of a beech, or an oak, in an English wood does not possess. I have sent by this packet, as a contribution to your museum, a model of a mahogany truck, on which is placed a log of that wood, supposed to be twenty feet in length. Yokes for fourteen oxen accompany it.

There is at present a great demand for fibres of every description, a demand which is more likely to increase than diminish. Jamaica is rich in materials from which this article is capable of being made. I believe, however, that Mexico, Yucatan, and Honduras, possess plants of spontaneous growth, from which a superior fibre may be produced to that which is made from the plantain stalks and penguins of the island above mentioned. I have forwarded to you a specimen of fibre which is made from a species of aloe, which grows spontaneously in great abundance in the forests of this country. The Indians of Yucatan use it for ropes, hammocks, and other purposes. In a book descriptive of the Isthmus of Tehuantepec, "being the results of a survey for a railroad to connect the Atlantic and Pacific oceans, made by the scientific commission under the direction of Major J. G. Barrow, U. S. Engineer," the plant of which I have been speaking is thus noticed:

—"Among the spontaneous products is the *bromelia pita*, or ixtle of the Isthmus, which differs in some respects from the *agave Americana* of Europe, the *pulgue de maguery* of Mexico, and the *agave sisalana* of Campeachy. Of this prolific plant there are numerous varieties, all yielding fibres, which vary in quality from the coarsest hemp to the finest flax. Nor is the value of the plant diminished by its indifference to soil, climate, and season. The simplicity of its cultivation, and the facility of extracting and preparing its products, render it of universal use. From it is fabricated thread and cordage, mats, bagging, and clothing, and the hammocks in which the natives are born, repose, and die. The fibres of the pita are sometimes employed in the manufacture of paper; its juice is used as a caustic for wounds, and its thorns serve the Indians for needles and pins."

I observe in your *Journal* of the 25th of May, a quotation from a letter of Mr. Thomas Hancock, published in the *Gardeners' Chronicle*, in which he inquires whether caoutchouc may not be cultivated in Jamaica or the East Indies: I cannot say whether it may or may not be cultivated in Jamaica, but in British Honduras, the India rubber tree—as it is here called—is a spontaneous product. This tree is to be found in every part of the settlement. It does not grow in rows and clumps like the cahoun, but is scattered about and interspersed with other trees in the bush. The caoutchouc which is produced from it is, I believe, of a superior quality. The manner in which it is extracted is extremely simple. A bottle is placed at the root of the tree at sunset, and a perpendicular incision is made in the bark in a line with the neck. In the morning the bottle is full of a white liquid caoutchouc, which in a short time becomes black and solid. When an accident happens to a woodcutter's inexpressibles,—uninitiated in the mysteries of thread and needle, he inflicts with his machete (a kind of cutlass) a wound upon the indian rubber tree; instantly gushes out in a stream, like blood from the human subject, the thick milk-white sap, and with this adhesive fluid he repairs his rent habiliment. As soon as I am able to procure a specimen of the caoutchouc of this country, I shall forward it to your Society.

I have sent you by this packet two more bottles of the juice of the prickly pear. I feel firmly persuaded that this extract, if not equal to the cochineal, would be in many cases an excellent substitute for that dye. The cochineal insect is only crimson because it feeds upon the cactus; if it fed upon a different plant, it would doubtless be of a different colour. There is this distinction between the crimson of the prickly pear and that of the cochineal; the former is elaborated by nature, the latter by artificial means. What change the sap of the cactus (for it is upon the green leaf that cochineal feeds) undergoes by the deglutitive and digestive process of the insect, to render the animal dye superior to that of the vegetable, I am unable to say. But supposing the cochineal to be superior to the juice of the prickly pear, in what consists that superiority? Certainly not in the brilliancy of the colour. It must consist, then, in the permanency of the dye. If it be so, it would not, I apprehend, be very difficult to fasten the colour of the prickly pear by some chemical process which would not be injurious to the fabric. The prickly pear is not an unwholesome fruit,—the juice of it would therefore be very useful in confectionery, to colour jujubes, bon-bons, and the various preparations of sugar,—and also in cookery, to give either a rich glowing crimson or a delicate roseate tint to jellies, blanc-manges, ices, and such like dainties. The honest wine merchant also might find his account in it. It would communicate to his twenty-years' old Port, or his vin de Bordeaux, or Chambertin, of the Philpot-lane vintage, or grown in the rural solitudes of Farringdon-without or Bishopsgate-within, a hue far preferable and more wholesome than that of logwood, of which the world is becoming somewhat weary.

I have the honour to be, sir, yours, &c.,

R. TEMPLE.

## Home Correspondence.

## DECIMAL COINAGE.

SIR,—I have had in my possession for some time the enclosed reply, written by the same "London Merchant" as furnished the original article. I hope you may still consider it worthy of a place in the *Journal* of the Society.

Yours very truly,  
J. E. GRAY.

British Museum, August 15, 1855.

SIR,—In Professor De Morgan's "*reply to statements in favour of a tenpenny unit*," addressed to the honourable member for South Lancashire, and directed to members of the Legislature, and distributed by the Decimal Association, which statements appeared in the *Times* City article of 3rd May, there is a remarkable display of small wit at the expense of sound reason. On a question of so much importance, about to be submitted to the consideration of the Legislature, the latter is the ingredient with which we have to deal; and in desiring to separate the "chaff" from the wheat, we shall give a preference to the practical over the sentimental. It is only, therefore, to some of the paragraphs, which the Professor has numbered, that any answer is required.

2, 3, and 5.—The Professor contents himself with denying the necessity for using three decimal places to express in mils an equivalent to a farthing, but he forgets that the prices of many commodities are *smaller* than a farthing, and although he might adopt 1m. instead of .001 to denote a single mil, he will find a lower decimal (equivalent to the 8th, 16th, 32nd, or 64th of a penny) somewhat difficult to express clearly in mils without the risk of mistake. He denies that our present mixed system affords any superior facilities for mental processes, and challenges the advocates of the tenpenny to produce their calculations in contrast with those of the £ and mil. We accept it—and shall take his own figures in illustration. What is the freight on 1632 cwt. of cotton at  $\frac{1}{16}$ d. per lb? Mr. Brown will inform the learned Professor that calculations like this are of constant occurrence in Liverpool.

BY THE MENTAL PROCESS.	BY THE £ AND MIL SCHEME.
Every clerk knows that $\frac{1}{16}$ d. per lb. is equal to $\frac{1}{16}$ d. per cwt., therefore $\frac{1}{16}$ d. = 2s. 11d.	1632
1632 X 2s. 11d. = 136 X 35s.	112
Or £136 + £102 = £238. This result being obtained in less time than we take to read it, by memory alone.	3264
	1632
	1632
	182784
	1½ mil*
	182784
	60928
	£243.712

Again, taking the Professor's figures, "What is the value of 1632 articles at £1 17s. 9d.?"

BY MENTAL PROCESS.	BY £ AND MIL SCHEME.	BY THE TENPENNY PROCESS.
1632 at £1 $\frac{1}{4}$ s + 3d.	1632	1632
Or £3080 + 408s., or £20 8s., = £3080 8s. This result a clerk of less than average ability can arrive at immediately, without putting pen to paper.	18875	45.3
	8160	4896
	11424	8160
	13056	6528
	13056	
	1632	xdy 73929.6
	£3080.4000	

It requires no additional evidence to establish the fact, that a *high* unit for a decimal system of coinage is quite impracticable for calculations by mental processes.

The learned Professor is unquestionably a high authority on subjects of science, but with all possible respect to his opinions and authority, practical men will consider that

\* The nearest equivalent, if our opponents allow us to employ a fraction so favourable to them, but which is not decimal.

he is but imperfectly acquainted with the details of commercial affairs (and this is a question rather of details than results), in supposing that 8ths of a penny are not now employed in quoting the prices of articles. If Mr. Brown replies candidly to the learned gentleman's letter, he must correct him upon this point, by informing him that cotton is sold in the market at as low as 16ths of a penny per lb., that the freights in this commodity are calculated as low as 32nds, and that many articles manufactured of the material are reckoned even as low as 64ths of one penny. The official lists of imports and exports will enlighten the Professor as to the proportion of our commerce directed to this article and its products alone, without reference to other innumerable branches of manufacture, and to the consequently extended use of small divisions in our money system, and the necessity for preserving them in all their simplicity, which the *tenpenny* admits of, but the £ and mil do not. These minute subdivisions of the £ are employed likewise in the quotations of prices of hides, timber, spices, haberdashery, and in freights of such commodities as coffee, &c., &c.

4.—The great gist of the question lies under this head, and the Professor, apparently knowing the weakness of his position as the advocate of the pound unit, states it clearly. His words are:—"We do not contend for £1 as the unit, but for £1 as the *highest* unit [*Italics* sic]. The decimal system makes passage from one unit to another much more easy, but it does not bind us to think in terms of one unit when another would be more convenient, &c." There is an obscurity in this definition. The £ is or is not to be the ruling unit. Our decimal system of coinage, to be effective, must comprehend the *most convenient* unit. We contend that the submultiples or descending decimals of one pound are *inconvenient*, and that the united multiples and submultiples of *tenpence* are convenient, and overcome every possible difficulty. Here lies the question between us.

6.—The Professor is here at fault—he says the tenpenny unit "*displaces both the shilling and the pound*," but he admits that the "*shilling would exist under a tenpenny system as 1.2, but it could never be a coin.*" Without criticising the paradox, we say, that every existing coin being formed of  $\frac{1}{10}$ ths of tenpence, or a certain number of pence, may always exist, if the public require their use, as *coins of circulation although not coins of account*, and this is the great advantage the tenpenny possesses over the pound as a unit for decimal coinage. This statement is the more disingenuous, because, in referring to one of these coins in connexion with the £ and mil scheme, he observes, "In the plan we propose the shilling, though thrown out of *account*, remains unaltered, and may be used both in thought and in speech as at present."—(See Preface to Report of Dec. Assoc. 129.)

The learned Professor is facetious on the point as to the fixed price of standard gold. He reminds one of the philosopher who told his son, "My dear boy, when your antagonist adduces an argument you cannot answer, laugh at his absurdity;" or to the advice given to a newly-inducted judge, "Be decided; pronounce your judgment; but, remember, never give a reason for it." He objects to the price of gold as being *too small* for illustration! We answer,—add your £50, £75, or even your £100 to the £3 17s. 10½d., and the result by the £ and mil scheme will still appear at disadvantage. Here it is—

By £. s. d.	By £ and Mil.	By Tenpenny.
3 17 10½	3.89375	93.45
28 17 10½	28.89375	693.45
53 17 10½	53.89375	1293.45
78 17 10½	78.89375	1893.45
103 17 10½	103.89375	2493.45
269 9 4½	269.46875	6467.25
47 Figures.	43 Figures.	33 Figures.

If he wishes a higher comparison, and will take the trouble of increasing the £3 17s. 10½d. by the decimal of £100, ascending to £1,000,000, he will find the results (including the addition of the 5 lines) produced by £ s. d. in 66 figures, by £ and mils in 62 figures, and by tenpennys in 50 figures only.

These illustrations are given on his own invitation, and he will doubtless make the best of them, but the point still remains unchanged as to the price of standard gold. He cannot state it millesimally in less than 6 figures, while in tenpennies it can be expressed in 4.

But let us leave the *fixed* value, and take the *fluctuating* price of bullion:—

	£ s. d.	£ and Mil.	Xdy.
Price of Foreign Gold } in Bars, per oz.....	3 17 9	3.8875	93.30
Mexican Dollars .....	4 10½	.2453125	5.8875
Silver in Bars (Standard)	5 0½	.2526041.6	6.0625

The learned Professor, we suspect, will somewhat resemble the Irish deserter; hit him *high*, or hit him *low*, there is no pleasing him.

His criticisms on the calculations of the division of £100, between 3, 6, 7, 8, and 9 persons, are singularly uncharitable. His knowledge of figures must have told him that the error was in the press, but as each of the lines of division is unquestionably correct, (each making the £100) his idea of pocketing a commission of £12 2s. 2d. by the transaction is *clever—very!*

15. The Professor's conceptions of a "unit" are somewhat remarkable. He says, "A pound is the large unit—a shilling is the small one." Perhaps, arithmetically, it would be most correct to say, that *one penny* is the unit of our present coinage. But when (desiring to have the pound and florin) he says, "Show us any proportion to the comparative value of commodities which the florin would not procure and the 10d. would," we feel ourselves challenged, and we reply, that by his scheme the florin contains 100 cents. (or mils of £1), while by the tenpenny system, 240 such cents. would be contained in the florin. He seems to have a virtuous sort of horror at small change, but every poor woman who has to buy salt or soda, several pounds of which are sold for a penny, or the thousand other articles of small value, will speedily enlighten him as to the comparative usefulness of the smallest coins.

#### DECIMAL SYSTEM FOR BANKERS AND MERCHANTS.

SIR,—By legalising the *hundredth of a pound* as the elementary unit of cash and accounts, the *real* currency of the nation, namely, the silver and gold, would at once be decimalised.

There would not even be any immediate necessity for a new coin, as the present currency would effect all payments with sufficient accuracy for the business of bankers and merchants. A hundred "cash" might still be termed a pound for convenience, and five "cash" a shilling. £149 14s. 7½d. would thus be written £149.73 cash, and the odd cash might be paid with fourteen shillings, a "sixpence," and a penny. Also, 69½ cash would be paid with thirteen shillings and eleven pence.

It is obvious that reduction from the present system to that proposed would be accomplished by merely multiplying pence and shillings by five. And since the proposed unit is equivalent to the quarter-franc, multiplication by four would reduce French money to English.

Should it be thought advisable to coin the silver unit, it would be necessary to have the fifth of a penny in copper, which might be termed a "doit." Therefore, two pence and two doits would be exchangeable for one "cash." Accounts would be kept by tradesmen and shopkeepers in

pounds, cash, and doits; the third column being used by them for twelfths of a *cash*, as at present for twelfths of a *shilling*.

Thus the relative value of pound, shilling, and penny, would remain undisturbed, and we should have the most convenient coinage in the world. *Twelfths* are decidedly more convenient than *tenths* in petty dealings.

		TABLE.	
Cash.	value	s.	d.
1		0	2½
2		0	4½
5	"	1	0 (shilling).
10	"	2	0 (florin).
20	"	4	0
50	"	10	0 (half sovereign).
100	"	20	0 (sovereign).

I remain, Sir, your obedient servant,  
SAMUEL A. GOOD.

H.M. Dockyard, Pembroke Dock, Sept. 17, 1855.

#### CHARCOAL AS A DISINFECTANT.

SIR,—I beg leave to trouble you with a few remarks in reference to charcoal as a disinfectant, which now justly engages considerable attention.

Charcoal has rarely been employed, in modern times, as a therapeutical agent, although its qualities as such, in particular cases, can scarcely be equalled, and is not, perhaps, surpassed by any other substance. In the interior provinces of Mexico, where no drugs were procurable save those "simples" which the ingenuity and the experience of the Indian herbalists have devised, I found vegetable charcoal, freshly burnt, of inestimable value. Reduced to powder, and given in a water vehicle, it removes, within a few hours, offensive odours from intestinal and renal discharges, and from the breath; and it also purifies offensive exhalations from the feet, and from any other part of the human body, either given in water or in the form of pills, made up with wheat-flour and water, or gum mucilage. Given in the same form, it removes those local pains about the right shoulder which are usually attributed to temporary obstruction of the liver, and this within forty-eight hours. It is not less efficacious, in combination with rhubarb, in diabetes, I believe, although I have had only two cases in which it was tried. As an antacid, either alone or combined with rhubarb and carbonate of soda, it removes heartburn speedily and permanently.

In the case of a man bit by a *rattlesnake*, the individual was restored to health by immersing the body in a running stream, at intervals, in order to keep down the circulation, and by administering to him charcoal pills every four hours during two days and nights.\* In this case the pills were made up with an equal weight of common soap and charcoal; at the same time the wound inflicted by the reptile was sufficiently lanced, and sliced pieces of the *Cactus cylindricus* were applied to the place. This, changed occasionally, brought on a considerable discharge of clear, yellow lymph.

In ordinary cases of diarrhoea, administered in a water vehicle it speedily removes the affection.†

But animal charcoal is also of the highest importance in certain cases. The preparation which I was accustomed to give in Mexico was one long gone out of use, although held in high estimation and constantly prescribed in former days by Sydenham, Boerhaave, Ettmuller, Willis, Morton, Baglivi, Mead, and others. This remedy was the *lining membrane of a chicken's gizzard*, charred in an oven, but not burnt to a charcoal. The charred skin, re-

\* Vide Travels in the Interior of Mexico during the Years 1825, 1826, 1827, and 1828, by Lieut. R. W. H. Hardy, R.N.

† The method of using and preparing charcoal for this purpose I forwarded to the Right Hon. Sydney Herbert, then Secretary-at-War, by whom it was sent to Dr. Andrew Smith, director-general of the medical department, from whom I had the honour to receive suitable replies.



duced to a coarse powder, is given in water in dysentery, diarrhoea, cholera morbus, and discharges of blood by stool, or by the mouth. In external hemorrhage the part requires only to be dusted with the powder; the bleeding is almost immediately arrested.

The science of medicine is one of experiment and experience, nor can any fixed principles be laid down for it till the chemical action of different substances upon the system shall have been accurately determined by proper tests, applied to the several matters discharged from the entire system of the human body. Every recommendation therefore which is founded on experience, is worthy of further investigation; and if any of your subscribers are desirous of further information upon the subject treated in this letter, I shall be happy to do so through the medium of your *Journal*.

I am, sir, your obedient servant,  
R. W. H. HARDY.

### CORT'S INVENTIONS.

#### No. II.

SIR,—My late father, in his work on Iron and Steel, published in 1840, gives the following as "the grand epochs in the manufacture of this metal:"—

- "1. The invention of the blast furnace.
- "2. The use of pit coal and pit coal coke in the smelting and manufacture of iron.
- "3. The invention of puddling and rolling bar iron by Mr. Cort.

"4. The introduction of Mr. Watt's double blast engine.

"5. And, though last, not least important, is the application of heated air to blast furnace operations."

As from the year 1785 to his decease in 1847, my father had constantly given his indefatigable and intelligent attention to every question connected with the subject of this great manufacture, and was the first person who in this country applied the discoveries of modern chemistry to a philosophical explanation of its highly interesting processes, these words offer a strange, but an authoritative, contrast to the following passage of the report of the Committee of the House of Commons in 1812:—

"Your Committee have not been able to satisfy themselves that either of the inventions claimed by him (Mr. Cort), one for subjecting cast iron to an operation termed puddling during its conversion into malleable iron, and the other for passing it through fluted or grooved rollers, were so novel in their principles or their application as fairly to entitle the petitioner to a parliamentary reward."

This resolution, as is shown by Mr. Richard Cort's narrative, was based on the adverse evidence of two ironmasters, who, to the astonishment of the whole trade, singled themselves out from that body, to oppose the petitioner's claim, and contradict the universal testimony, placing themselves in a position, rendered more extraordinary by the fact that one of them in person, and the partners of the other had joined in passing, a year before, at a meeting at Gloucester, a unanimous resolution "that the iron trade was greatly indebted to Mr. Henry Cort for his inventions of puddling and of grooved rollers, and that a subscription should forthwith be commenced for the relief of his widow," and to which fund and resolution Mr. Samuel Homfray, the principal witness against the novelty and value of the inventions, *had subscribed*.

For the better understanding of the merits of Mr. Cort, and the demerits of his opponents, I propose to give a brief sketch of the practical processes in use at the date of Mr. Cort's discoveries.

The earliest known process for the manufacture of iron was that of the bloomery. Only the richest descriptions of ores were adapted to this operation, and during the unnumbered centuries when it prevailed, the accessible parts of veins above the water mark were ransacked for

their richest produce, leaving those vast excavations which in some districts, as for instance, in the Forest of Dean, fill the mind with astonishment at the amount of iron which must have been manufactured by so slow and limited a manipulation. The oldest form of this furnace was the air-bloomery, where the heat was maintained without the aid of blast, the lumps of rich ore stratified with wood-charcoal were gradually deoxidised, and as they sank to the bottom of the furnace, became aggregated into malleable iron. This is the *rationale*, however varied in the detail, identical with the proposition for making malleable iron direct from the ore by Mr. Renton, described in Professor Wilson's valuable paper read at your meeting in March last. This process was afterwards, at some unknown date, expedited by the application of bellows; a greater heat was obtained, and in consequence, besides greater rapidity of manipulation, the earthy particles were fused and separated, and a purer and more homogeneous quality of iron brought under the hammer. The use of the blast bloomery led by degrees to the invention of the larger structure of the blast furnace, and to the product of cast iron, where the metal is not merely deoxidised, but further combined with a portion of carbon, which imparts its fusibility and fluidity. A metal was thus obtained more completely freed from earthy particles, ores of much less richness could be operated upon, and a vast accession was made to the extent of the manufacture, permitting the erection of numerous blast furnaces in Sussex and other districts for the reduction of ironstones combining a large per-centage of earthy mixture. To convert the cast product to the malleable form a modification of the blast-bloomery had to be adopted. The object was now to remove the carbon from the pig iron by the action of the blast, and not, as before, to remove the oxygen from the ore by the action of the charcoal. A wider and shallower description of bloomery furnace was planned, that the iron might be merely fused with the smallest contact with charcoal, and exposed before the blast until the carbon was burnt away, and the mass aggregated in the less fusible condition of malleable iron. This was the process in general use at the date when Mr. Cort, with an intuitive sagacity far beyond the chemical knowledge of his age, imagined and perfected the process of puddling.

At this time the gradual diminution of forests and woodlands had reduced to a very low ebb the manufacture of pig iron with charcoal; the manufacture with pit coal coke, patented by Dudley in 1619, had slumbered until about 40 years prior to the inventions of Mr. Cort. During this period it had sensibly progressed, the superior applicability of pit coal pig iron to the purpose of castings, for artillery, &c., &c., had aided the scarcity of wood fuel in giving this branch of the manufacture an impetus, and numerous furnaces were being erected in England and in Scotland, where the juxta-position of the coal and the ironstone afforded such economical facilities.

When Mr. Cort directed his attention to ironmaking, the works of these districts had already substituted pit coal coke for wood charcoal in the decarbonising or malleableising furnace I have described, called the refinery, or hollow fire. The charcoal refinery was retained only for special uses which required great purity and toughness, such as wire, or tin-plates, which were then commencing to be introduced as a staple manufacture. But whether the coke or the charcoal refinery was used, the process was the same,—the pig iron melted down was exposed to a stream of blast directed downwards on its surface, until the deprivation of carbon destroyed its fluidity, and the metal cohered in the less fusible malleable state.

The idea of producing the same effect in a more convenient and economical manner, by the flame of pit coal acting upon the metal exposed on the wide floor of a reverberatory furnace, was conceived by Mr. Cort; and to his sagacity in conceiving and perfecting this idea, and in devising further processes in aid of it, to substitute the tedious



and imperfect action of the forge-hammer, England owes her crystal palaces, her vast artillery, her iron ships, her railways,—in a word, her present wealth. Though his inventions were *immediately* addressed to the production of wrought iron, they have indirectly as much contributed to the production of cast iron, for neither of these forms of metal are used without a large accompaniment of the other form.

The operations I have described were purely empirical. What chemical changes took effect in their progress were wrapped in total darkness. The phlogiston of Scheele then reigned as the only explanation of the processes of combustion, and in a very interesting letter, written by Mr. David Hartley, upon an inspection of the new operations of Mr. Cort, he ascribes the blue flame emitted by the pig iron in the puddling furnace, during its progress to malleability by combustion of its carbon, to the *expulsion of sulphur*. It would be most interesting to have some record of the views of Mr. Cort upon his own operations, but I cannot understand that he has left any. Certain it is he could know nothing definite of the combinations and decompositions going forward, for Lavoisier had not yet unlocked the whole arcana of modern chemistry by revealing the nature of oxygen and its agencies. It was nearly 20 years later that my father, in his publications, first applied these discoveries in a clear explanation of the details of the various processes of ironmaking. Mr. Cort's success must, therefore, have been achieved by that practical instinct which has mainly invented and established every useful art, for we are bound to confess that science has come in most frequently as a mere commentator on the works of practical genius, teaching us less how to do what is useful than explaining the *modes* after it has been done.

During the manipulations of the malleableising refinery it was a common practice with the workmen to hasten their operation by tapping out a portion of the yet liquid metal from the hearth, and, when set, throwing it on the top of the fire to be remelted. This served two purposes; by diminishing the thickness of the fluid stratum under the blast, its decarbonization was more rapidly effected, and at the same time, by using the waste heat at the top of the fire, to re-melt a portion of the metal, it passed the blast again in its descent, still further promoting the decarbonisation of the whole.

When the large Welsh works adopted the process of Mr. Cort, which under the master-eye of the inventor was so conducted that his produce, even when puddled from common ballast, was equal in quality, as proved in the trials at the Royal Dockyards, to the best Swedish iron, purchased at the enormous price of £35 to £40 per ton! they found some difficulty, having lost the benefit of Mr. Cort's personal instructions, with which they commenced, in maintaining the quality of their iron to the high mark which the navy required, and which Mr. Cort himself had fully met. Iron bottoms to the puddling furnace, invented many years afterwards by, I think, the Harfords, of Ebbw Vale, were not dreamed of at that early stage, and it was found that in the rough adoption of puddling in works going for quantity more than quality, a considerable portion of silica from the sand bottoms (as very early pointed out by my father) united with the iron and impaired its quality. And the longer the iron was kept exposed on the floor of the reverberatory, the greater was of course the tendency to such alloy. Therefore, to *shorten* the operation of puddling, and thereby improve the product, it occurred to some of the ironmasters who had the refineries for the old process remaining erected at their works, to turn them to account by melting pig iron in them as before, and running out the whole of the metal when it arrived at the last stage of fluidity previous to malleableisation. This metal, the same which the old refiners were in the habit of casting back into the finery, as I have described, was called "*finer's metal*." Deprived of a considerable part of its carbon, it was far advanced toward the malleable stage, and by introducing this sub-

stance instead of the more carbonised raw pig iron into the puddling furnace, the operation was greatly shortened and improved. The labour and wages of the puddler were diminished, the waste by oxidation under prolonged exposure to flame was diminished, the absorption of silica was diminished, and greater yield and better quality of yield obtained from a given weight of pig iron.

The "*finery*," therefore, so extraordinarily perverted before the Committee as *superseding* the merits of Mr. Cort, thus became a useful *adjunct* in the early stages of the adoption of puddling by the common mass of manufacturers, who were not to be expected to possess that critical skill which had been distinctively acquired by the inventor of the operation. Subsequent improvements have comparatively dismissed the expedient use of the refinery, and a large portion of the iron of this kingdom is now manufactured by *puddling alone*, without the intervention of the other stage. The use of iron bottoms is one of these improvements. The introduction of the wide hearth, four or five times its previous area in the blast furnace, with the other improved modifications created by Mr. John Gibbons, of Corbyn Hall, rendered the production of white or forge iron from the blast furnace a less hazardous and more regular attainment, and it is now a practice to run white iron approaching to finer's metal from the blast furnace, and carry it to the puddling furnace direct. The adoption of the highly metallic cinder of the forge and mill as a decarbonising medium in the puddling furnace, called "*boiling*," and the kindred process of my father for using the pure oxide of hæmatitic ores for the same purpose, have further tended to the exclusion of the finery, and the establishment of the puddling furnace *alone*. In short, the refinery, used as a *cheval de combat* in the astonishing opposition to Mr. Coningsby Cort's petition, is becoming more and more a thing of the past, leaving the puddling process to remain sole and paramount. It has gone on increasing in utility and perfection, as must inevitably be the march of a sound invention based on economical principle; and puddled iron is now employed in a variety of choice uses, for which at one time it was supposed that only the produce of the most careful manufacturers, with wood charcoal, were admissible. In another letter I propose to offer some remarks on the second great invention of Mr. Cort, the grooved or fluted roller, for the merits of which the Committee of 1812 could not satisfy themselves that the inventor had any claim.

Before proceeding further in the practical consideration of this important subject, I cannot refrain expressing my great vexation at the questionable appearance of Mr. William Crawshay, in Mr. R. Cort's review of the report of the Committee of 1812. Intimate with my late father, it is extremely painful to see one of my father's friends standing in an ambiguous light. We must, perforce adopt the apology and explanation advanced by Mr. Richard Cort, that Mr. W. Crawshay was at the time young and inexperienced in the details of ironmaking. What if we assume that iron-kings are subjected to the destinies of other monarchs, where the heir apparent habitually leads the opposition against the sovereign regnant—an assumption which will leave it less difficult to account for Mr. William Crawshay's appearance in opposition to the experienced seniors of his own domain. I think it was not until after 1812 that Mr. W. Crawshay became regent at Cyfarthfa, after the commencement of which rule my father was for some years extremely intimate, passing much time at those works in prosecuting various patent processes. I am quite sure that in this period my father would lose no opportunity in doing justice to the origin of the transcendent gifts bestowed by Mr. Cort on the iron trade in his inventions of puddling and rolling; and it is impossible to doubt that Mr. Crawshay is now correctly informed, and disposed to look with regret on the serious position into which he was betrayed by the misguided energies of Mr. Samuel Homfray before that unfortunate Committee. Mr. W. Crawshay is a known

advocate of plain dealing, the duties and the advantages of honesty have ever been a prominent theme in his public addresses on various occasions. Though rapid in decision, there is no want of the element of generosity in his character, but rather a lively admiration for romantic acts of public spirit. Did he not start forward the first volunteer with £500 to head a subscription for preserving inviolate the asylum of the Hungarian Norsemen from the brute menaces of Austria and Russia? Where there is public spirit there must inevitably be public justice, and I am sure no one more than himself now mourns the errors of the proprietor of Pennydarran, who in 1811 subscribed an acknowledgment of the claims of Mr. Cort on the iron trade, and in 1812 exerted himself in persuading a legislative Committee that Mr. Cort never had any claims upon the iron trade at all. A man who could thus turn himself quite round in one year, showing a white face to his compeers at Gloucester, and, after a twelvemonth, a black one to his young friend Mr. W. Crawshaw, in London, ought to have been set upon a pivot and kept in violent rotation all the rest of his life, to realise to the eye a uniform neutral tint, which might conceal such pie-bald patches of character from the vulgar gaze. It was sad indeed for the man who had erected his puddling furnaces and rollers 23 years before, under the direct instructions of Mr. Cort's workmen, "as the best and cheapest plan," and had profited by 20,000 tons of iron made out of them during the ten years the patent contract with Mr. Cort remained in force, though uninforced by the corrupt officials of the navy, and for 13 years more, up to 1812, had profited at an increasing rate of manufacture, to say as he *actually did* to the Committee that he did not know one furnace in existence working on Mr. Cort's plans. Are we to suppose that he acted from one sole mercenary motive—irrespective of honour, decency, and truth—a desperate terror to avoid a call for payment of the £10,000 due under the contracts on 20,000 tons of iron, at the royalty of 10s. per ton as contracted for. We may easily conceive Mr. William Crawshaw as a young man who knew nothing of these things. The paymaster of the navy had clapped his extinguisher on Mr. Cort so long before, that the real facts were lost in darkness. It is even possible that his father, Mr. Richard Crawshaw, knew the truth but imperfectly, though he also was a contracting party to Mr. Cort's patents for 10s. per ton; for in a letter to the Earl of Sheffield's secretary, dated 1808, he states that Cort and Jellicoe had ruined themselves by attempting the processes which he himself had profitably perfected under his own personal superintendence. This statement exhibits an entire ignorance of the facts. Cort and Jellicoe did not ruin themselves by their attempts; they had perfected the process to the highest degree, producing iron tested successfully in all the royal dockyards against the best Swedish iron. They had erected then successful furnaces and rollers at Cyfartha. Mr. Samuel Homfray had erected exact copies of these by the same workmen at Pennydarran; 10s. per ton was agreed to be paid for the use of them, and other ironmasters had likewise so erected and agreed to royalties, which would have realised to the holders of the patents £187,000 in ten years. The way in which Mr. Cort was ruined was this. Mr. Alexander Trotter, paymaster of the navy, had delivered to Mr. Adam Jellicoe, chief clerk in the office of the treasurer of his Majesty's navy, the sum of £27,500 and upwards, to be paid in discharge of the wages of the officers and seamen of his Majesty's navy, which sum said Adam Jellicoe, representing it as his own money, lent to Mr. Henry Cort, who had already expended a large private fortune in completing his works, at five per cent. interest, half the profits of his trade and patents, and an appointment for his son as manager of the works. I know nothing of the routine of Government offices; it is for those who do to explain how the officers and seamen of the navy could contentedly go without their wages whilst Jellicoe was lending their money to Mr. Cort. But I presume there

was a way of doing it. One would have supposed the complaints of those in deficit would have reached the vigilant paymaster's ear, long before death revealed Mr. Jellicoe's default. That event rendering it clear, Mr. Alexander Trotter lost no time in protecting himself by issuing an extent in aid, under which Mr. Cort's works and private effects were sold for £15,334 14s. 0½d. Had the goodwill of the premises been also sold, for which Mr. Cort had paid £19,548, considerably more than enough would have been realised to discharge the whole claim to the Crown. But had that been done the *patents could not have been locked up in the office of the Crown solicitor*. They must have been delivered to the patentee, and he would have received the royalties due upon them. However, for the balance of the default, a little over £10,000, they were locked up by this just and upright paymaster, and the public treasury remained defrauded of this sum, whereas if the exemplary functionary had exacted payment from the ironmasters of their contracts, little more than one year would have cleared the balance of defalcation, and a three years' receipt of those royalties, in the first instance, would have satisfied the treasury debt, without the destructive and cruel sale of Mr. Cort's effects.

Why the paymaster preferred the pleasant alternative of crushing Mr. Cort, and why one of the contracting parties whom that paymaster so liberally favoured, should have so strenuously exerted himself in 1812 to prove that the processes, for the use of which he had contracted with Mr. Cort twenty-three years before, were of no value, is likely now to rest unexplained, *except by conjecture*.

Watt's patent for the condensing engine was extended after its expiration for a further term of fourteen years; Cort's inventions were to the full equally deserving of such an extension, but Watt was fortunate enough to find a private gentleman for his colleague, and thus avoided having his fortune and his honour swallowed up in the intrigues of the maelstrom of official corruption.

From an ignorance of these, the real and baser features of the case, we may account for Mr. W. Crawshaw following the dictation of Mr. Samuel Homfray, and asserting that "if his family had pursued the plans of Mr. Cort, they would have been ruined," which, by implication, meant the plan of trusting the deputy paymaster would certainly have brought ruin. In the other sense Mr. Cort made the fortunes of all the iron-trade, and of the whole kingdom by his inventions, and would have regained his own and something more, had not a public servant seen reason to make a sacrifice of the inventor to the contractors for the invention.

I am anxious by every possible view to vindicate Mr. William Crawshaw, pointing out in what manner his youth may have been misled, by the interested Mr. S. Homfray, into an unfortunate opposition to the opinions of the senior partners of his father's concern. No one is likely now to regret more than himself the injustice which others rendered him an unconscious instrument in assisting them to effect.

Mr. Benjamin Hall, his father's partner, was most urgent in advocating the claim of the petition. What the other members of the committee were thinking of it is impossible to say. They probably left themselves in the hands of the chairman, trusting in safety to his scientific reputation, and it was, therefore, doubly unfortunate that a gentleman whose qualifications were sufficient to raise him subsequently to the chair of the Royal Society proved incapable of maintaining the rights of a scientific invention against miserable and truculent misrepresentation. We might have expected that as a mathematician he would have been struck with the beautiful effect and principle of the grooved roller, that he would have been anxious, as a point of abstract interest, to ascertain the origin of so effective a simplicity, combining numerous dynamical and mechanical refinements. It was to be expected that his love of science, with such a *chef-d'œuvre* before him, would have followed up the investigation, and

if a doubt were raised as to Mr. Cort's paternity, that he could not have rested until he discovered the true father, instead of deserting the achievement, as *nulli filius*, in an illegitimatised condition. To say the best of it, never was a more slovenly examination. No caution, no sense of the importance of the business, was exhibited; no adjournment to complete the evidence to meet unlooked-for attacks; they seemed as if in haste to do injustice. The Comptroller of the Navy, the Secretary to the Admiralty, the Secretary to the Treasury, all three on the Committee, were, though they might know nothing of Mr. Trotter, of course *ex-officio*, as a point of duty, opponents to any demand on the public purse. I wish it were on record who actually drew the report. I was too young to know Mr. Davies Gilbert myself, but have been intimate with his near friends, who considered him amiable. But I never heard it said he was "a strong-minded man;" and equally strange with his signing such a report is the fact, that he never moved the house, though as chairman it was his office so to do, to carry out the report which he had signed, and vote the petitioners as was recommended, a sum in discharge of the expenses of their petition. He left them to pay the costs of Mr. Homfray's malignant calumnies.

It is a truly painful case. We read, over and over again, in every kind of publication, for youth or for age, the names of our public benefactors. Now the nation owes her spinning mills to Arkwright, her canals to Brindley, her philosophy to Bacon, steam-engines to Watt, steam-boats to Fulton and Miller, railways to Stephenson; the names of these men and others are familiar in our mouths as household words; we for ever meet them employed "to point a moral or adorn a tale," besides their permanent achievements. It is time that the name of Cort should be no longer excluded from its authentic position in the catalogue of national worthies; though we love honour, we must not shrink from dishonour where it is due, nor hesitate to place this right benefactor's memory in the right place because the tale is associated with acts of public ignominy. The truth cannot longer be concealed—the wisest course will be for all who are in the slightest degree implicated or liable to implication, to shake off from their characters at once—and unhesitatingly—all possibility of the imputation of persevering in dishonour.

I am, Sir, your obedient servant,  
DAVID MUSHET.

September 1st, 1855.

### Proceedings of Institutions.

LONDON.—The half-yearly meeting of the members of the Jews and General Literary and Scientific Institution was held in their premises in Sussex Hall, Leadenhall-street, on the evening of Monday, July 30th. The chair was occupied by Mr. Montefiore, the President of the Institution. The attendance was numerous. The half-yearly report was read, approved of, and adopted. It is gratifying to be able to state that during the by-gone half-year the Institution has prospered, as well in the acquisition of lecturers as in the state of its funds, the latter of which is not a little owing to the munificent donation of £100 from the President. The issue of books from the library during the past half-year was nearly 5,000, many of those sought by the younger subscribers being historical or scientific. It was mentioned, on behalf of the Managing Committee, that the prosperity of the Institution was in a great measure promoted, and their own labours greatly relieved, by the valuable aid afforded by the Auxiliary Committee. The office of Secretary having become vacant, the Committee reported that they had appointed Mr. James Coutts, late Secretary to Mr. W. M. Thackeray, to perform the duties of that office. —Votes of thanks to the Auditors, to those gentlemen who lectured gratuitously, and to the Stewards at the

anniversary dinner, were respectively moved, seconded, and carried, and a cordial vote of thanks was given to the President. The following are the Lectures which were delivered on the Thursday Evenings of the Session:—"On the Products of the Forests of the Globe, in their Relation to Commerce, the Arts, and Manufactures."—By P. L. Simmonds. "On the Advantages resulting from the Study of Science."—By the President. "A Drawing Room Entertainment."—By the Members of the City Elocution Class. "On the History of the Jews in Spain, under the Moors."—By Francis H. Goldsmid. "On the Life and Writings of Thomas Ingoldsby."—By Henry Thomas. "On Pope and his Writings."—By Morris S. Oppenheim. "On Old English Travels in Russia."—By the Rev. J. Llewelyn Davies, M.A. "On the Piano Forte, its Origin, Progress, and Development."—By Charles Salaman.

### PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From Gazette September 14th, 1855.]

Dated 15th August, 1855.

- 1847. L. A. Pouget, Paris—Moderator lamps.
- 1849. G. Napier, Glasgow—Furnaces.
- 1851. J. Avery, 32, Essex-street, Strand—Apparatus to be applied to drawers to secure them. (A communication.)
- 1853. J. Barber, Manchester—Steam engines.
- Dated 16th August, 1855.
- 1855. P. A. le Comte de Fontaine Moreau, 4, South-street, Finsbury—Jacquard machines. (A communication.)
- 1857. T. Williams, Liverpool—Breech loading fire-arms.
- 1859. A. Shanks, 6, Robert-street, Adelphi—Machines for shaping nuts.
- 1861. C. Rowley, Birmingham—Elastic bands.
- 1863. S. Monk, Smethwick—Bricks.
- 1867. W. E. Baker, Cannon-street West—Sewing machines.
- Dated 17th August, 1855.
- 1869. J. Fenton, Lancaster—Moderator lamps.
- 1871. G. Collier, Halifax—Weaving plush by power.
- Dated 18th August, 1855.
- 1873. E. Heys, Hulme, Manchester—Flyers used in spinning.
- 1877. A. Savage, Eastcheap—Mechanism for treating tea, sugar, coffee, and chicory.

Dated 20th August, 1855.

- 1879. A. R. Le Mire de Normandy, 67, Judd-street, Brunswick-square—Soap.
- 1881. A. Bain, Westbourne Park-road—Apparatus for distributing liquids.
- 1883. W. Soelman, 3, Bennett-street, Fitzroy-square—Propellers.
- 1885. H. Knighton, Stamford—Portable drill.
- 1887. J. H. Brown, 4, Trafalgar-square—Ball cartridges.
- Dated 21st August, 1855.
- 1889. G. Lewis, Leicester—Taps and cocks of glass.
- 1891. J. Cornes, Swan-lane—Consuming smoke.
- 1893. J. Orange, Nottingham—Covering yarns or other cores.
- 1895. E. Field, Drury-lane—Machinery for embossing and colouring.

Dated 22nd August, 1855.

- 1897. D. de Bussac, Brussels—The combination of hydriodic acid, watery or oily, or salts of iodine with tannic acid, the constituting parts of cinchona, or of sarsaparilla, or of the leaves of the walnut tree and iron, or with one or several of these bodies.
- 1899. M. Blum, Ilzach, Ht. Rhin, France—Hood.
- 1901. J. J. Lownds, New York—Extension pen and pencil case.
- Dated 23rd August, 1855.
- 1903. J. T. A. Zinkernagel, Paris—Mosaic work.
- 1905. W. Jones, Pendleton—Printing woven fabrics and paper hangings.
- 1907. V. Fouchier, 39, Rue de l'Echiquier, Paris—Mill stones.
- 1909. J. G. Martien, Newark, New Jersey, U.S.—Oxydes of iron.
- 1913. T. Bartlett, Charnery, Savoy—Machinery for drilling or boring into stone.

Dated 24th August, 1855.

- 1915. W. Wood, Monkhill, near Pontefract—Pile and other fabrics.
- 1917. W. S. Gooding, Manchester—A tailor's clay cutter.
- 1919. T. A. Radiguet, Longjumeau—Dynamical apparatus for motive power.
- 1921. C. Schlickeyesen, Berlin—Pipes, bricks, and tiles.
- Dated 25th August, 1855.
- 1923. J. Avery, 32, Essex-street, Strand—Apparatus for exhausting and closing vessels. (A communication.)
- 1925. J. Avery, 32, Essex-street, Strand—Improvements in sewing machines. (A communication.)
- 1927. C. F. Stansbury, 67, Gracechurch-street—Mill for grinding. (A communication.)
- 1929. E. Carless, East London Works, Mile-end—Artificial leather.
- Dated 27th August, 1855.
- 1932. F. Rualem, 29, Rue de Paris, à Belleville, France—Fuel for household and general purposes.
- 1933. C. E. Capron, 4, South-street, Finsbury—An improved cupping apparatus.

1934. J. Woodswoorth Robson, 23, Grundy-street, Poplar New Town—Water closets.
1935. T. A. Cooling, Temple-chambers, Whitefriars—Pumps.
1936. C. Humfrey, jun., 14, Terrace, Camberwell—Fatty and oily acids.
1937. E. C. F. Sautelet, Paris—Impermeable cloth.
1938. J. Smith, Bristol—Perambulator and invalid carriages.
1939. S. Ludbrook, Mile-end—Railway wheels.
1940. W. Johnson, 47, Lincoln's-inn-fields—Rolling or shaping metals. (A communication.)
1941. W. Johnson, 47, Lincoln's-inn-fields—Railway breaks. (A communication.)
1942. C. Humfrey, jun., 14, Terrace, Camberwell—Candles.
1943. C. Esplin, 21, Windmill street, Lambeth—Gas regulator.
1944. A. V. Newton, 66, Chancery-lane—Separating substances of different specific gravities. (A communication.)
1945. A. E. L. Belford, 32, Essex-street, Strand—Percussion guns. (A communication.)
1946. B. Moore, New York—Sewing machines. (A communication.)  
*Dated 28th August, 1855.*
1947. J. Hopkinson, jun., Huddersfield—Furnaces.
1948. E. N. Fourdrinier, 22, Percy Circus, Pentonville—Machines for cleaning table knives.
1949. R. A. Brooman, 166, Fleet-street—Umbrellas. (A communication.)  
*Dated 29th August, 1855.*
1950. J. Booth, Manchester—Machinery for drilling and boring.
1952. C. F. Stansbury, 67, Gracechurch-street—Seed planter. (A communication.)
1954. C. Radcliffe, Sowerby Bridge—Moistening textile fabrics for finishing.  
*Dated 30th August, 1855.*
1955. J. More, Glasgow—Marine and surveying compasses.
1957. J. Gedge, 4, Wellington-street South, Strand—Casks. (A communication.)
1959. C. F. Stansbury, 67, Gracechurch-street—Plane-iron. (A communication.)
1959. C. F. Stansbury, 67, Gracechurch-street—Changeable lock. (A communication.)
1960. C. F. Stansbury, 67, Gracechurch-street—A machine for splitting leather. (A communication.)
1961. J. Juckes, 18, Baker-street, Islington—Furnaces.
1962. H. C. Jennings, 8, Great Tower-street—Medicine for cholera and diarrhoea.
1964. P. E. Charton, Troyes, France—Metallic manometer.  
*Dated 31st August, 1855.*
1965. W. R. Palmer, New York—Writing-desks.
1966. R. Schramm, 6, Warwick-crescent, Harrow-road—Obtaining oil. (A communication.)
1967. J. Gedge, 4, Wellington-street South, Strand—Kilns, ovens, or furnaces. (A communication.)
1968. G. F. Rose, Birmingham—Lithographic and copper-plate printing presses.
1970. J. White, East-street—Machinery for cutting soap. (A communication.)  
*Dated 1st September, 1855.*
1972. R. W. Winfield and J. Jackson, Birmingham—Metallic bedsteads, &c.
1976. A. I. Austen, Belmont, Vauxhall—Candles and night lights.
1978. T. Bentley, Margate—Heating water or other fluids by gas.  
*Dated 3rd September, 1855.*
1984. T. J. Larmuth and J. Smith, Salford—Printing machinery.
1986. E. G. Jones, Smethwick—Flattening cylinders of sheet glass.
1988. W. H. Zahn, New York—Machinery for making covered or plated twist and cord.
1990. H. E. Flynn, Retreat, Ranelagh, Dublin—Communications between guards and drivers of railway trains.
1992. W. A. Gilbee, 4, South-street, Finsbury—Carburetted hydrogen gas. (A communication.)
1994. G. H. Golding, Maidstone, and T. Paine, Blackheath—Boots, shoes, clogs, &c.  
*Dated 4th September, 1855.*
1996. W. Woodcock and T. Blackburn, Over Darwen, and J. Smalley, Blackburn—Pistons.
1998. W. H. James, Camberwell—Steam engines.
2000. D. G. Forter, Pentonville—Training plants.
2002. W. De la Rue, Bunhill-row—Treating Burmese naphtha.
- 2004.—A. Morel, Roulaix, France—Preparing fibrous materials to be combed or spun.
2006. J. H. Bull, West-Farms, Westchester, U.S.—Fountain inkstands.

## WEEKLY LIST OF PATENTS SEALED.

- Sealed August 31st, 1855.*
1431. William Teall, Wakefield—Improved method of treating and working soapy or greasy waters in order to obtain the greasy substances therefrom.
1451. Sydney Smith, Hyson Green Works, near Nottingham—Improvements in apparatus for insuring the correct action of the safety valves of steam boilers, and for regulating the action of the dampers of steam boilers.
1505. John Inglis and Archibald Cowie, Glasgow—Improvements in moulding or shaping metals.
1562. James Caldwell and James Baiden Affleck McKinnel, Palmerstone Iron Works, Dumfries—Improvements in machinery or apparatus for cutting or reducing vegetable substances.
1572. Robert Cochran, Verreville Pottery, Glasgow—Improvement in the preparation of clay for potters' use.

1578. Louis Roch, New York—Improvements in machines for making pulp from wood and vegetable fibrous substances.  
*Sealed September 7th, 1855.*
505. William Weild, Manchester—Improvements in looms or machinery for weaving pile fabrics.
507. John William Sloughgrove, and James Henry Wheatley, Windsor-street, Islington—Improvements in smoke-consuming furnaces.
521. John Aitken and Servetus Aitken, and John Haslam, Bacup—Improvements in machines used for preparing, spinning, and doubling cotton, wool, flax, silk, and other fibrous materials.
525. Julian Bernard, Club Chambers, Regent-street—Improvements in the manufacture of boots and shoes, or other coverings for the feet, and in the machinery or apparatus to be employed therein.
541. Alexander Clark, Gate-street, Lincoln's-inn-fields—Improvements in the construction and manufacture of celestial and terrestrial globes for the study of astronomy and geography.
544. Charles Heaven, Hull—Improvements in machinery used for embroidering fabrics.

PATENT ON WHICH THE THIRD YEAR'S STAMP DUTY IS PAID.  
1852.

103. Charles Lungley, Poplar—Improvements in ship-building.  
*Sealed September 10th, 1855.*
556. David Macaire, Paris—Improvements in casks and taps.
568. Robert Neale, Cincinnati, U.S.—Improvements in copper and other plate printing.
571. Jonas Marland, Sun Vale Iron Works, Walsden—Improvement or improvements in the manufacture of rollers for drawing, spinning, doubling, and preparing cotton, wool, flax, and other fibrous materials, a part or the whole of which improvement or improvements are applicable to shaping metals for other purposes.
575. Joseph Turner, Farringdon-street—An improvement in coffin furniture.
625. Benjamin O'Neale Stratford, Earl of Aldborough, Stratford-lodge, Wicklow—Improvements in aerial navigation, and in the application of the same to warlike purposes.
629. Isaac Rogers, North Haverstraw, U.S.—Improvements in the mode of treating iron ores.
653. T. F. E. Clewe, Paris—A new construction of locomotive engines, tenders, and railway carriages.
661. John Britten, Birmingham—A new or improved machine for sweeping or cleaning chimnies.
691. William Henry Gauntlett, Banbury, Oxfordshire—Improvements in apparatus for cutting or pulping turnips and other roots.
693. Frederick William Mowbray, Shipley—Improvements in bearings for the axles of railway wheels, and of other axles or shafts; which improvements are also applicable to axles or shafts, and other like rubbing surfaces.
869. Charles McIlvaine Congreve, New York, U.S.—Improvements in the manufacture of iron when oxide iron ores are used.
937. Julius Jeffreys, Kingston-hill, Surrey—Improvements in engines or machines for raising, diffusing, or injecting fluids.

PATENT ON WHICH THE THIRD YEAR'S STAMP DUTY IS PAID.  
1852.

87. Robert Robertson Menzies, Glasgow, N.B.—Improvements in the manufacture of carpets and other fabrics.  
*Sealed September 12th, 1855.*
558. Auguste Edouard Loradoux Belford, 32, Essex-street, Strand—Improvements in musical wind instruments.  
*Sealed September 14th, 1855.*
575. Julian Bernard, Club chambers, Regent street—Improvements in the manufacture of boots and shoes and other coverings for the feet, and in the machinery connected therewith.
579. Abraham Davis, Tottenham Court-road—Improved polishing powder.
580. John Hetherington, Manchester, and Archibald Vickers, Bristol—Improvements in machinery for preparing, spinning, and doubling cotton and other fibrous materials.
583. Nathan Robinson, John Lister, and Henry Stevenson, Bradford—Improvements in looms for weaving cocoa nut matting and similar fabrics.
634. James Biden, Gosport—Improvements in marine steam engines.
723. William Henry Balmain, St. Helen's—Improved methods of or processes for recovering oxide of manganese after it has been used in the manufacture of chlorine.
935. François Joseph Anger, 16, Stamford-street, Blackfriars-road—New metallic alloy.
1087. James Buchanan, Glasgow—Improvements in the manufacture of heddles or heads for weaving. (Partly a communication.)
1104. Edward Fellow Plenty and William Pain, Newbury—Improvement in ploughs.
1190. Robert William Waithman, Bentham-house, York, and Joseph Waithman, Manchester—Improvements in machinery or apparatus for the manufacture of lint or similar substances.
1219. John Whitehead, jun., and Robert Kay Whitehead, Elton, near Bury—Improvements in finishing woven fabrics.
1475. Simon Davey, Tucking Mill, Illogan, Cornwall—Improvement in the manufacture of safety fuzes for mining and military purposes.
1535. Alfred Vincent Newton, 66, Chancery-lane—A new manufacture of fire and burglar proof glass.

## PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

4. James Hodgson, Liverpool—Improvements in constructing iron ships and vessels.
6. Moses Poole, Serle-street—Improvements in the manufacture of guns and pistols.
16. Moses Poole, Serle-street—Improvements in the manufacture of telescope and other tubes.
19. Moses Poole, Serle-street—Improvements in moulding articles when india rubber combined with other materials are employed.
24. Moses Poole, Serle-street—Improvements in the making covers for and in binding books and portfolios, and in making frames for pictures and glasses.
28. Moses Poole, Serle-street—Improvements in coating metal and other substances with a material not hitherto used for such purposes.
29. John Daniel Ebingré, Brussels—Improvements in the manufacture of animal charcoal.
30. Moses Poole, Serle-street—Improvements in the manufacture of trunks, cartouche and other boxes, knapsacks, pistol-holders, dressing, writing, and other cases, and sword and other sheaths.
33. Moses Poole, Serle-street—Improvements in the manufacture of pails, tubs, baths, buckets, measures, drinking and other vessels, basins, pitchers, and jugs, by the application of a material not hitherto used in such manufactures.
36. James Hare, Birmingham—Improvements in expanding tables and music stools.
37. Moses Poole, Serle-street—Improvements in covering and sheathing surfaces with a material not hitherto used for such purposes.
43. Moses Poole, Serle-street—Improvements in harness, and in horse and carriage furniture.
123. Richard Whytock, Green-park, Zibberton, Mid Lothian—Improvements in the manufacture of fringes, and in pleat for these and other ornamental work.
163. Moses Poole, Serle-street—Improvements in the manufacture of tables, sofas, bedsteads, stands, chairs, and other articles of furniture, and the frames and bodies of musical instruments.
275. Alphonse René le Mire de Normandy, Judd-street—Improvements in obtaining fresh water from salt water.
335. Robert Cochran, Glasgow—Improvements in kilns.
376. Henry McFarlane, Lawrence-lane—Improvements in constructing metal beams or girders.
510. John Tayler and James Slater, Manchester—Improvements in machinery, apparatus, or implements for weaving.
761. Samuel Holt, Stockport, Cheshire—Improvements in weaving cut-piled fabrics.
785. Peter Carmichael, Dens Works, Dundee—Improvements in machinery for winding yarn or thread.
798. Jean Joseph Jules Pierrard, Paris—Improvements in preparing wool and other fibrous substances for combing.

Sealed September 18th, 1855.

613. Philippe Roehrig, Paris—A new or improved alimentary substance.
614. Louis Henry Crudner and Frederic Louis Koebrig, Tottenham Court-road—Improved apparatus for purposes of ventilation.
615. John Smalley, Bishopgate—Improvements in railway carriage axles.
621. William Taylor, Poolstock—Improvements in the construction of "pickers" for power looms.
622. Thomas Mara Fell and Francis Squire, 74, King William-street—Improvements in balance levers and apparatus for weighing, and modifications thereof for the purpose of detecting base coin.
624. Charles Marsden, Kingsland-road—Improvement in tent-poles.
629. Auguste Edouard Loradoux Belford, 32, Essex-street, Strand—A new and improved governor for engines and machinery.
631. William Miller, North Leith—Improved apparatus for the prevention of smoke and promoting ventilation.
654. Griffith George Lewis, C.B., Major-General Royal Engineers, Woolwich, and Joseph Gurney, St. James's-street—Improved construction of knapsack, convertible when required into a bed, a litter, or a tent.
686. William Dray, Swan-lane—Improved gear for communicating power from horses or cattle for the purpose of driving machinery.

701. Alexander Dalgely, Deptford—Improvements in steam-engines.
702. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in anchors. (A communication.)
705. Anatole Bère, Lille, France—Improvements in steam boilers.
715. Theophilus Wood Bunning, Newcastle-upon-Tyne—Improvement in steam engines.
716. Theophilus Wood Bunning, Newcastle-upon-Tyne—Improvements in steam engines.
750. Maximilien Evrard, Saint Etienne, France—Improved continuous drawing-compressor for moulding or bruising several substances or mixtures.
786. Peter Armand le Comte de Fontaine Moreau, 4, South-street, Finsbury—Certain improvements in the construction of steam boilers. (A communication.)
853. John Kay, Bonhill—Improvements in preparing and printing textile fabrics and other surfaces.
886. Richard Bright, Bruton-street—Improvements in lamps and in lamp-wicks.
970. Pierre Dépierre, 101, Rue de Seine, Paris—Improvements in dyeing, part of which improvements is applicable to the manufacture of ink.
983. Thomas Lambert, Harrington-square—Improvements in piano-fortes.
989. William Basford, Penclawdd—Improvements in purifying coal gas, and for obtaining a residuum therefrom, which may be used as a pigment or colour, or for other useful purposes.
1148. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in signals for nautical purposes. (A communication.)
1312. Isaie Lippmann, 4, Rue Geoffroy Saint Hilaire, Paris—Improvements in the treatment of hides and skins for the manufacture of leather.
1377. John Sollars, Monsall-house, Manchester—Improvements in the manufacture of starch and in the use of substances employed therein.
1503. William Clay, Liverpool—Improved mode of manufacturing forged iron.
1561. Edwin Daniel Chattaway, Edinburgh—Improvements in buffing and coupling apparatus for railway carriages and rolling stock.
1597. William Edward Newton, 66, Chancery-lane—Improved mechanism for operating the shuttles of looms.
1599. William Fidding, Putney—Improvements in coverings for the feet of bipeds and quadrupeds.
1600. William Fidding, Putney—Improvements in the manufacture of building materials.
1601. Scipion Salaville, Paris—Improved apparatus for airing and preserving grain, seeds, apples, potatoes, hops, and other similar articles in granaries, warehouses, and ships.

## PATENTS ON WHICH THE THIRD YEAR'S STAMP DUTY HAS BEEN PAID.

12. Thomas Wood Gray, Warkworth-terrace, Commercial-road, Limehouse—Improvements in steam-engines.
41. Joseph Barrans, Queen's-road, Peckham—Improvements in steam-engine boilers.
42. Oswald Dodd Hedley, Newcastle-upon-Tyne—Improvements in getting coal and other minerals.
103. Thomas Fearn, Birmingham—Improvements in ornamenting metallic surfaces, and in machinery and apparatus to be employed therein.
120. George Collier, Halifax—Improvements in the manufacture of carpets and other fabrics.
121. John Lee Stevens, Kennington—Improvements in furnaces.
172. John Jobson, Litchurch—Improvements in manufacturing moulds for casting metal.
245. William Dray, Swan-lane, London-bridge—Improvements in machinery for reaping and mowing.
247. Christopher Nickels, York-street, Lambeth, and Frederick Thornton, Leicester—Improvements in weaving.
326. Charles William Siemens, Adelphi-terrace—Improvements in engines to be worked by steam and other fluids.
354. Joseph Walker, Dover—Improvements in machinery for crushing and bruising malt, grain, and seeds.
543. John Norton, Cork—Improvements in blasting.
698. Oswald Dodd Hedley, Newcastle-upon-Tyne—Improvements in getting coals and other minerals.
808. George Wilson, York Glass Company—Improved manufacture of glass bottles and jars.
1013. George Collier, Halifax—Improvements in the manufacture of carpets and other fabrics.

## WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
3752	September 6.	Brooch and Dress Fastening .....	Joseph Parkes.....	Birmingham.
3753	"	{ Stamp for Embossing Designs on } Paper and other Substances. .... }	Hume and Melville .....	Edinburgh.
3754	September 10.	Brush.....	James Eagles and Son .....	Walsall.
3755	September 11.	Portable Economic Fireproof Building...	Samuel Hemming .....	Clift-house Works, Bow.
3756	September 14.	French Signal and Cooking Lamp .....	Tucker and Son .....	190, Strand.
3757	September 18.	{ Mouthpiece for Cornopeans and other } Musical Instruments .....	Henry Bird .....	Stourbridge.
3758	"	Under Shirt .....	Donaldson, Hirsch, & Spark .....	33, Spencer-street, Goswell-road.
3759	September 19.	Reversible Carriage Mantle .....	Henry Barry Peacock .....	9, St. Ann's-square, Manchester.